

CLAIMS

1. A liquid supply system, comprising:
a liquid consuming section for consuming a liquid;
5 a liquid chamber communicating with said liquid consuming section;
a liquid containing section for containing the liquid;
and
plural communication channels for providing
10 communication between said liquid chamber and said liquid containing section, wherein
said liquid chamber forms a substantial closed space except said plural communication channels and said liquid consuming section, and
15 said liquid containing section has means for adjusting a pressure inside the system.
2. A liquid supply system as claimed in claim 1, wherein
said pressure adjusting means performs the pressure
20 adjustment so that a pressure that prevents leakage of the liquid from said consuming section and that permits a liquid consuming state of said consuming section acts inside the system.
- 25 3. A liquid supply system as claimed in claim 2, wherein
said pressure adjusting means has means for placing said liquid consuming section into a negative pressure state

relative to an atmosphere pressure and means for introducing atmosphere directly into said liquid containing section without via said liquid chamber in order to adjust the negative pressure state.

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4. A fluid communication structure for providing fluid communication between a liquid containing section for containing a liquid and a liquid consuming section for consuming the liquid, said fluid communication structure
10 comprising:

a liquid chamber communicating with said liquid consuming section; and

plural communication channels for providing communication between said liquid chamber and said liquid
15 containing section, wherein

said liquid chamber forms a substantial closed space except said plural communication channels and said liquid consuming section, and in a state where a gas exists inside the closed space, the gas can be transferred to said liquid
20 containing section via a part of said plural communication channels.

5. A fluid communication structure as claimed in claim 4, wherein said fluid communication structure, in terms
25 of its position during liquid consumption, is positioned substantially below said liquid containing section and positioned substantially above said liquid consuming

section with reference to a vertical direction.

6. A fluid communication structure as claimed in claim 5, wherein said plural communication channels have different heights of their opening positions in said liquid chamber side with reference to a vertical direction.

7. A fluid communication structure as claimed in claim 4, wherein in accordance with a relationship between a pressure difference originating from a water head of the liquid corresponding to a difference among the vertical heights of openings of said plural communication channels, inside said liquid consuming section and a difference among pressures originating from menisci formed by the liquid in the individual communication channels, an operation is performed such that, the gas in said closed space is transferred to said liquid containing section via the part of said plural communication channel, while the liquid is moved from said liquid containing section to said liquid consuming section via another part of said plural communication channels.

8. A fluid communication structure as claimed in claim 4, wherein only the part of said plural communication channels is formed such that a pair of the openings inside said liquid consuming section comes into contact with an inner wall of said liquid consuming section.

9. A fluid communication structure as claimed in claim 4, wherein only the part of said plural communication channels has a portion forming a groove extending along the communication channel and projecting from the opening of the communication channel inside said liquid chamber.
10. A fluid communication structure as claimed in claim 4, wherein only the part of said plural communication channels is configured such that its opening inside the liquid consuming section is always in contact with a liquid present in said liquid consuming section.
11. A fluid communication structure as claimed in claim 4, wherein inner walls of said plural communication channels have different contact angles with the liquid.
12. A fluid communication structure as claimed in claim 4, wherein said plural communication channels have different inside diameters.
13. An ink supply system, comprising:
a recording head for ejecting an ink;
a liquid chamber communicating with said recording head;
an ink tank for containing the ink; and
plural communication channels for providing

communication between said liquid chamber and said ink tank,
wherein

said liquid chamber forms a substantial closed space
except said plural communication channels and said
5 recording head, and

said ink tank has means for adjusting a pressure inside
the system.

14. An ink supply system as claimed in claim 13, wherein
10 said pressure adjusting means performs the pressure
adjustment so that a pressure that prevents leakage of the
ink from said recording head and that permits an ink ejecting
state of said recording head section acts inside the system.

15 15. An ink supply system as claimed in claim 14, wherein
said pressure adjusting means has means for placing said
recording head into a negative pressure state relative to
an atmosphere pressure and means for introducing atmosphere
directly into said ink tank without via said liquid chamber
20 in order to adjust the negative pressure state.

16. An ink supply system, comprising:
a recording head for ejecting an ink;
a liquid chamber communicating with said recording
25 head;
an ink tank for containing the ink; and
plural communication channels for providing

communication between said liquid chamber and said ink tank,
wherein

said liquid chamber forms a substantial closed space
except said plural communication channels and said
5 recording head, and

on ejecting of the ink from said recording head,
atmosphere is introduced into said ink tank with liquid
chamber side opening portions of said plural communication
channels being in contact with the ink.

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17. An ink tank that is connected via plural communication
channels to a liquid chamber communicating with a recording
head for ejecting an ink and thereby comes into fluid
communication with said liquid chamber, said liquid chamber
15 forming a substantial closed space except said plural
communication channels and said recording head, said ink
tank comprising means for adjusting a pressure inside an
ink supply system for supplying the ink to said recording
head.

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18. An ink tank as claimed in claim 17, further comprising
a connecting section capable of making connection to said
plural communication channels.

25 19. An ink tank as claimed in claim 17, wherein said ink
tank has at least a part of said plural communication channels
integral therewith.

20. An ink tank as claimed in claim 17, wherein said pressure adjusting means has a movable section that forms at least a partial portion of an ink containing space and
5 is displaced or deformed to enable changing an internal volume of the ink containing space and urging means for urging said movable section in a direction for increasing the internal volume to thereby place the inside of said recording head into a negative pressure state relative to
10 an atmosphere pressure.

21. An ink tank as claimed in claim 20, wherein said pressure adjusting means further has means for introducing atmosphere directly into said ink tank in order to adjust
15 the negative pressure state.

22. An ink tank as claimed in claim 17, further comprising: an ink containing chamber, for containing the ink directly, which is connected to said liquid chamber via said plural
20 communication channels; a negative pressure generating member, communicating with said ink containing chamber, for placing the inside of the supply system into a negative pressure state; and an atmosphere introducing hole capable of introducing atmosphere into the inside of said chamber.

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23. An inkjet recording head for ejecting an ink to thereby perform recording, the inkjet recording head having the

fluid communication structure as claimed in claim 4 integral therewith.

24. An inkjet recording apparatus, wherein an ink supply
5 system as claimed in claim 13 is used to perform recording as holding said ink supply system such that said liquid chamber is positioned substantially above said recording head and said ink tank is positioned substantially above said liquid chamber, in terms of their positions in use,
10 with reference to a vertical direction.

25. An ink supply system, comprising:
a recording head for ejecting an ink;
a liquid chamber communicating with said recording
15 head;
an ink tank for containing the ink;
plural communication channels for providing communication between said liquid chamber and said ink tank;
and
20 means for introducing atmosphere directly into said ink tank without via said liquid chamber.

26. An ink tank that is connected via plural communication channels to a liquid chamber communicating with a recording
25 head for ejecting an ink and thereby comes into fluid communication with said liquid chamber, said ink tank comprising:

means for introducing atmosphere directly into said ink tank without via said liquid chamber; and

means for adjusting a pressure inside an ink supply system for supplying the ink to said recording head.